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## Descriptions of two new genera and eight new species of the Boarmiini (Geometridae, Ennominae) from Sulawesi

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**Abstract** Eight new species of the Boarmiini are described from Sulawesi with the descriptions of two new genera.

**Key words** Lepidoptera, Geometridae, Ennominae, Boarmiini, new genera and species, Sulawesi.

Very recently Holloway (1993) completed his excellent work on the Ennominae from Borneo as the 11th part of "the Moths of Borneo". It has enabled the identification of the specimens not only from Borneo but from the other areas in Southeast Asia, such as Sumatra, Java and Sulawesi. In the course of my study on the Sulawesi specimens of the tribe Boarmiini, defined by Holloway (1993), I found some undescribed species. In this paper two new genera and eight new species belonging to the Boarmiini will be described from Sulawesi. All the new species are so far endemic to Sulawesi.

The following abbreviations are used to indicate the location of specimens. BMNH: The Natural History Museum, London. NSMT: National Science Museum, Tokyo. RS: R. Sato collection, Niigata.

### *Amblychia atropunctata* sp. nov. (Fig. 1)

Length of forewing. ♂ 50-53 mm. Both wings dark grey, mottled with reddish brown. Forewing: lines black; antemedial line broken at the middle; medial line evenly curved, indistinct; postmedial line usually well defined, strongly zigzag; a large rectangular white patch on the apex. Hindwing: similar to forewing, but antemedial line and apical patch wanting. Underside: similar in pattern to upperside, more uniformly grey, not speckled, but distal area white including a white patch on the apex of the forewing. Most similar to *A. sommereri* Holloway, 1993: 207, from Sumatra, in the colour of wings among the congeners, but easily distinguished from it by larger size, an apical white patch of forewing and not-speckled underside. Female unknown.

Male genitalia (Fig. 15). Uncus weakly bifid; gnathos strongly developed, longer than wide, tapering to rounded apical portion; valva rhomboid with a small central depression without any spines on central area; costa not swollen, bearing long hair-setae; aedeagus with a short lateral thorn subapically.

Holotype. ♂. S. Sulawesi, Puncak Dingin, 28. v.-3. vi. 1986 (native collector), NSMT. Paratypes. S. Sulawesi, Sampuraga 1,350 m, 1 ♂, 27. iv. 1994 (S. & A. Saito), NSMT. Nr North Border, Sampuraga 1,500 m, 1 ♂, v. 1986 (native collector), BMNH. Nr Ujun Padang, Palu 700 m, 1 ♂, ix-x. 1985 (S. Nagai), BMNH. Palolo 700 m, 1 ♂, ii. 1986 (S. Nagai), RS.

The reddish-brown mottled wings with apical white patches render this species unmistakable.

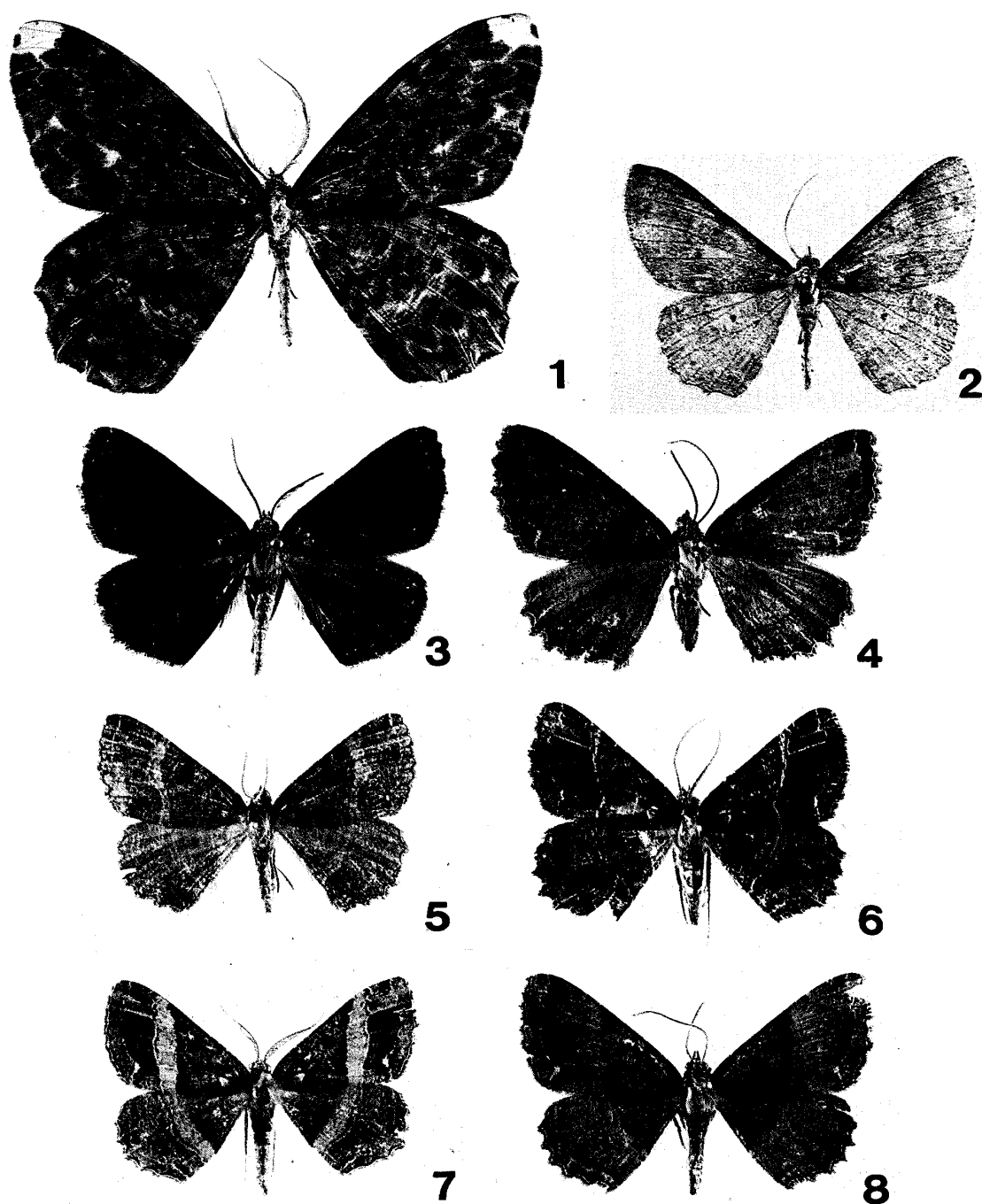


Fig. 1. *Amblychia atropunctata* sp. nov. Holotype ♂.

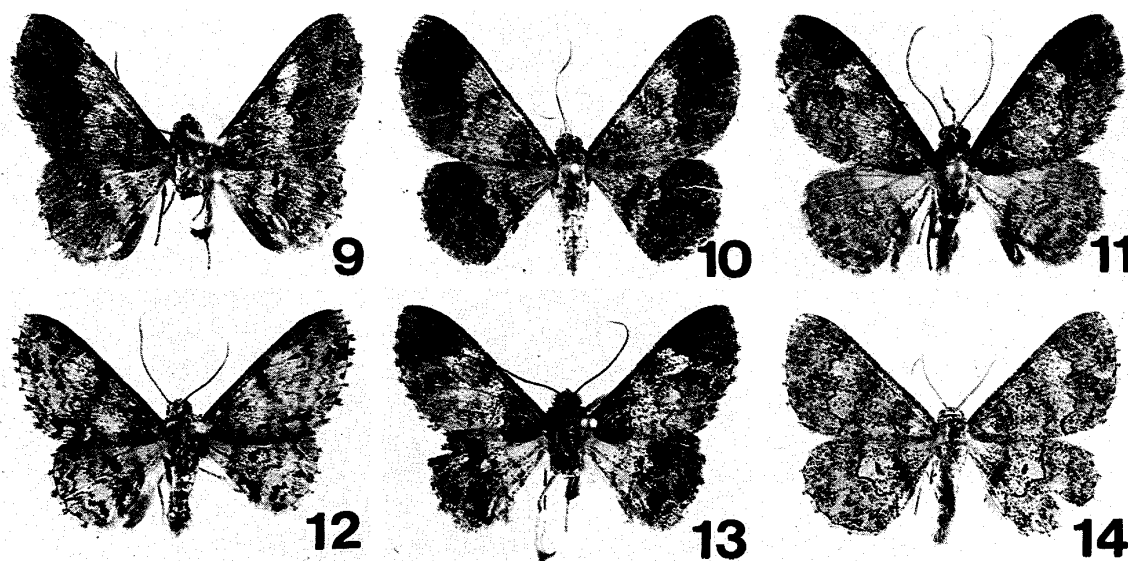
Fig. 2. *Catoria sulawesensis* sp. nov. Holotype ♂.

Figs 3-8. *Cryptomedasina* spp. 3-5. *C. nagaii* sp. nov. 3: Holotype ♂. 4: Paratype ♀.

5: Paratype ♂. 6-8. *C. vandenberghi* (Prout). 6-7: ♂. 8: ♀.

***Catoria sulawesensis* sp. nov. (Fig. 2)**

Length of forewing. ♂ 23-24 mm. Both wings purplish grey, with fuscous irroration and small black discocellular spots. Forewing: antemedial, postmedial and submarginal lines dark grey, not distinct; basal and outer areas darker than medial part. Hindwing: similar to forewing, but lighter in colour with more distinct postmedial line. Underside: pale grey without maculation except smaller discocellular spots than those of forewing.



Figs 9-13. *Ectropidia* spp. 9-10. *E. subprimata* sp. nov. 9: Holotype ♂. 10: Paratype ♀. 11. *E. saitoi* sp. nov. Holotype ♂. 12. *E. hollowayi* sp. nov. Holotype ♂. 13. *E. paraprimata* sp. nov. Holotype ♂.  
Fig. 14. *Diplublephara cornujuxta* sp. nov. Holotype ♂.

This species is easily separable from the other congeners by less punctuation and speckling on upperside and very weak discocellular spots on underside, not to mention the ground colour of upperside. Female unknown.

Male genitalia (Fig. 16). Uncus vestigial without spines. Gnathos weak. Costa of valva weakly sclerotized, almost even width, covered with fine hairs, extending beyond valvula, and with two digitate processes bearing one or two spines. Saccus strongly sclerotized, with a small, round, serrate-edged process at mid-dorsal margin, and free arm incurved towards ventral margin of valvula, apex obtusely bifid. A small pointed process produced from distal margin of valva, situated between valvula and saccus arm. Vesica armed with about twenty short spines.

Holotype. ♂, S. Sulawesi, nr north border, Puncak Dingin 1,700 m, x. 1985 (S. Nagai), NSMT. Paratypes. 1 ♂, same data as holotype, BMNH. Type locality, 2 ♂, x-xi. 1985 (S. Nagai), NSMT.

Though this species is not typical of *Catoria* in appearance, male quadripectinate antenna and genitalia show it should belong to the genus. The genus *Catoria* of Sulawesi has been represented by the two species, *olivescens* Moore and *delectaria* (Walker) (Prout, 1929).

### ***Cryptomedasina* gen. nov.**

Type species: *Medasina vandenberghi* Prout, 1928.

Proboscis well developed. Palpus long, extending beyond front. Male antenna unipectinate; each pecten scaled dorsally, arising from near the tip of the segment (Fig. 17); terminal one-third of antenna without pecten. Female antenna simple. Male third abdominal sternite with setal comb. Hind tibia of male with hair-pencil. Forewing with a large fovea in male; vein  $R_1$  arising from Sc, sometimes anastomosing with  $R_2$ ;  $R_2$  from before upper angle of cell, rarely connected with  $R_{3+4}$ .

Male genitalia (Figs 18-19). Uncus short, weakly bifid at apex. Gnathos slender, tapering to an elongate point medially. Valva slender, apically curving, with a prominent interiorly directed process subbasally on the sacculus. Juxta weakly sclerotized. Aedeagus short, narrowly sclerotized apically, bearing a short cornutus tipped with 3-5 spines on vesica.

Female genitalia (Figs 20-22). Ovipositor short. Sterigma lightly sclerotized with a small angular projection medio-posteriorly. Bursa copulatrix evenly sclerotized near ostium, with a slight shoulder-like dilation at one side posteriorly. No signum.

*Cryptomedasina* is clearly characterized by the male unipectinate antenna. The genus *Amraica* Moore has also the unipectinate antenna, but each pecten is much longer and not scaled dorsally. Male genitalia are similar to those of *Racotis* in having a spur-like process on sacculus, but the other characters are quite different. The systematic position of this genus is ambiguous so far. Prout (1928) described *vandenberghi* as a member of *Medasina* Moore, but at the same time he mentioned that it was "a striking novelty, forming a new section of the genus, probably ultimately a new genus". The two species from Sulawesi belong to *Cryptomedasina*: *vandenberghi* (Prout) and *nagaii* sp. nov.

***Cryptomedasina vandenberghi* (Prout), comb. nov. (Figs 6-8)**

*Medasina vandenberghi* Prout, 1928: 252.

Length of forewing. ♂ 19-22 mm, ♀ 20-23 mm. Variable in colour and maculation as pointed out in the original description. Male. Two distinct forms can be separated. In one form (Fig. 6) antemedial and postmedial lines clearly defined, while in the other form (Fig. 7) broad whitish band developed along inner margin of postmedial line, and antemedial line almost vanished. Female. Variable in the degree of development of medial dark bands, but there is no useful characters to separate any forms.

Male genitalia (Fig. 18). Valva tapering towards apex. Succular processes asymmetrical, left one longer and broader than right triangular one.

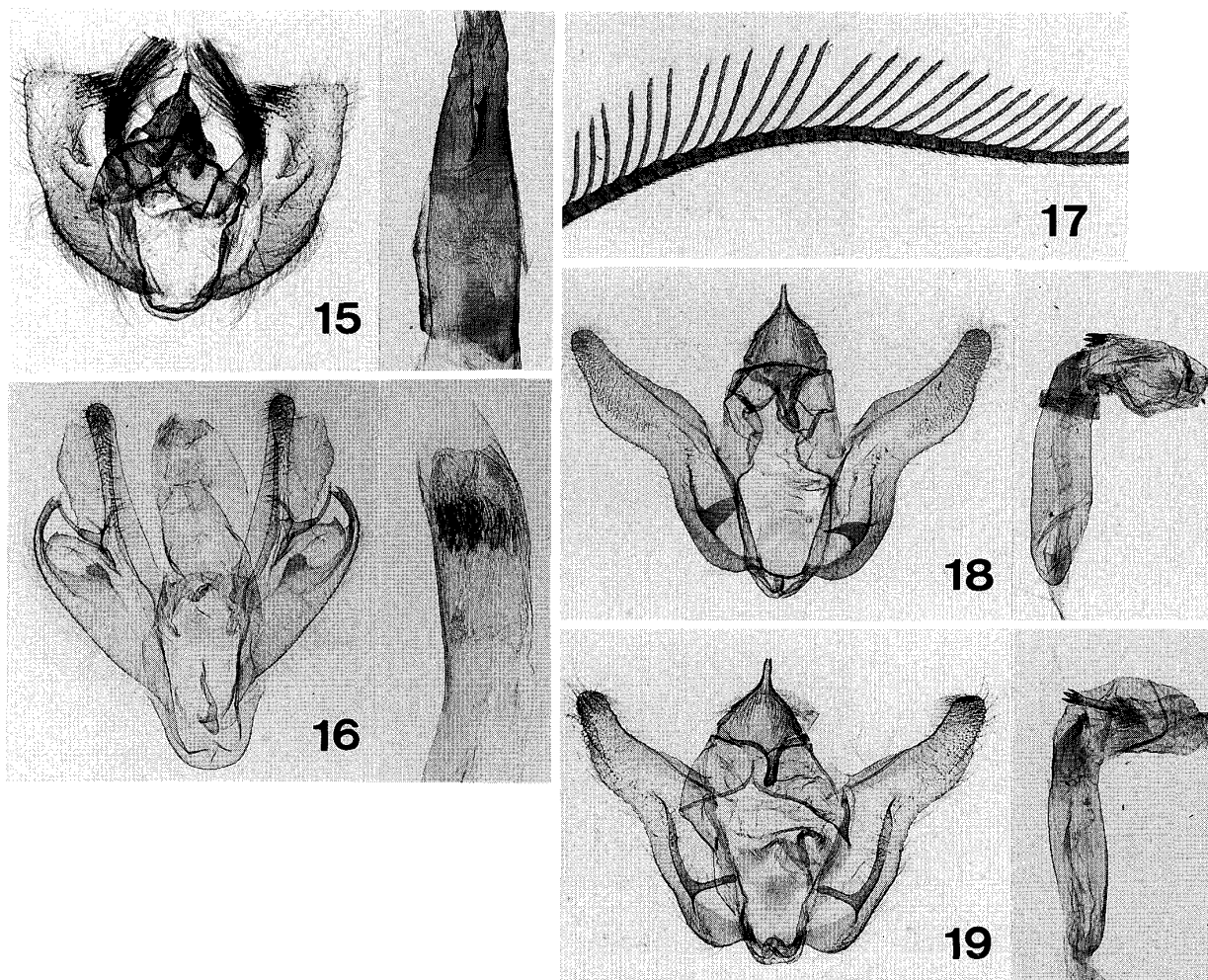
Female genitalia (Figs 20-21). Bursa copulatrix bulbous as a whole.

Material examined. Sulawesi, nr north border, Palolo 700 m, 2 ♂ 3 ♀, ix-x. 1985, 26 ♂ 6 ♀, ii. 1986; Sampuraga 1,500 m, 3 ♀, ix-x. 1985 (S. Nagai); Nr Tondano, Mt Makaweiben 1,000 m, 3 ♂ 4 ♀, vii. 1988 (N. Nishikawa), RS. I also examined one male specimen of the syntypes (6 ♂ 3 ♀) preserved in the BMNH.

All the specimens were taken at the low montane zone less than 1,500 m.

***Cryptomedasina nagaii* sp. nov. (Figs 3-5)**

Length of forewing. ♂ 21-22 mm, ♀ 22-26 mm. Male. One of the four male specimens examined, the holotype (Fig. 3), is quite different from *vandenberghi* in dark reddish brown wings with very obscure lines and minute discocellular streaks. The others (Fig. 5) are somewhat similar to *vandenberghi* in ground colour of wings with distinct bands and large round discocellular spots, but can be distinguished from it by slightly paler ground colour with yellowish tint, and yellow bands on forewing. Though there are many superficial differences among them, they are completely identical in the genitalia. Female (Fig. 4). Not so variable as in male. Both wings brown irrorated with fuscous. Forewing: antemedial and postmedial lines inconspicuous, sometimes represented only by dots, or vanished; discocellular spot black and roundish, but sometimes absent;



Figs 15-16. Male genitalia. 15. *Amblychia atropunctata* sp. nov. RS-4283. 16. *Catoria sulawesensis* sp. nov. RS-2804.

Fig. 17. Male antenna of *Cryptomedasina vandenberghi* (Prout).

Figs 18-19. Male genitalia of *Cryptomedasina* spp. 18. *C. vandenberghi* (Prout). RS-4291. 19. *C. nagaii* sp. nov. RS-4292.

medial dark band variable in the degree of development. Hindwing: antemedial line and discocellular spot lacking. Underside: evenly pale brown, with postmedial lines and discocellular spots on both wings. Any *vandenberghi*-like female specimens have not been found yet.

Male genitalia (Fig. 19). Valva not so elongate, smoothly rounded apically, with a pair of symmetrical slender processes on sacculus instead of asymmetrical ones in *vandenberghi*.

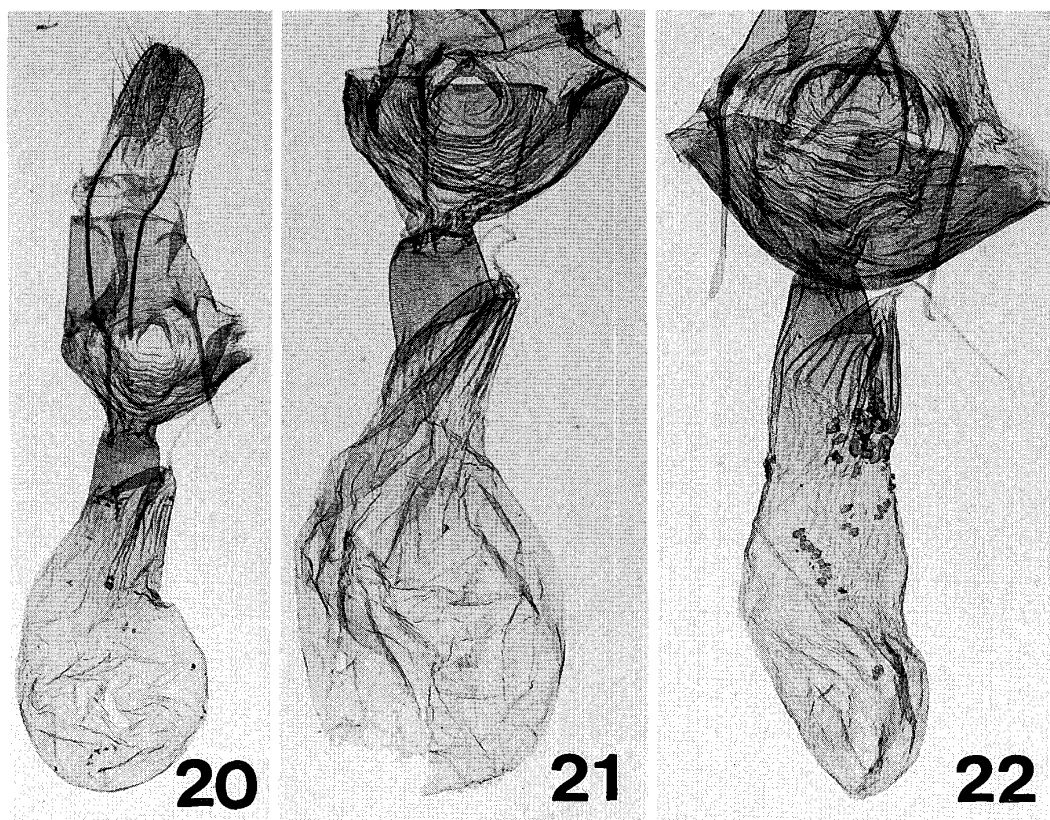
Female genitalia (Fig. 22). Bursa copulatrix slenderer than in *vandenberghi*.

Holotype. ♂, S. Sulawesi, nr north border, Puncak Dingin 1,700 m, x. 1985 (S. Nagai), NSMT. Paratypes. Same data as holotype, 3 ♂ 9 ♀, NSMT & RS.

This species is distributed at the higher montane zone than *vandenberghi*.

### ***Ectropidia* Warren**

Holloway (1991) mentioned that the genus *Diplurodes* Warren from Borneo are represent-



Figs 20-22. Female genitalia of *Cryptomedasina* spp. 20. *C. vandenberghi* (Prout). RS-4298. 21. *Ditto*. RS-4295. 22. *C. nagaii* sp. nov. RS-4294.

ed by three subgenera: *Diplurodes*, *Ectropidia* Warren and *Necyopa* Walker. Later he (1993) restored the last two as good genera, and at the same time established two new genera, *Chrysoblephara* and *Satoblephara*, to receive some heterogeneous species. These five genera are closely related to one another, and also sharing many characters with *Myrioblephara* Warren. Moreover *Diplublephara* gen. nov. to be described below may be involved in the same group. The genus *Ectropidia* was described by Warren (1895) based on *Acidalia exprimata* Walker, 1861, from Sarawak, Borneo. Holloway (1991: 358, fig. 14) showed that nine species of *Ectropidia* are distributed in Sulawesi. All of them were undescribed species, and indicated by the genitalia slide numbers in his figures. He discriminated a subgroup of three species (slide numbers 12417, 12418, 12420), where the uncus is a distinctive "wing-nut" shape and the more distal coremata of the male abdomen are lacking. In the following lines four species examined by myself will be described as new to science. All of them are not the members of the subgroup having "wing-nut uncus". They are very closely related to *altiprimata* Holloway, 1993: 258, from Borneo, sharing a number of characters as in the following. Male genitalia: uncus short; ventral margin of the costa of valva covered with numerous fine setae; spine-like setae arising from saccular process and ventral margin of valva. Male abdomen: strong coremata present between segments 3 and 4, and not so strong ones between 5 and 6, besides coarsely spined short coremata between 7 and 8. Male hind leg: tibia prominently dilated, bearing numerous grayish hair-scales.

***Ectropidia subprimata* sp. nov.** (Figs 9-10)

Length of forewing. ♂ ♀ 15-16 mm. Male. Antenna fasciculate; sensilla very long; terminal two-fifths ciliated-setose. Hindwing with a tuft of greyish hair-scales on the

dorsum. Both wings brown irrorated with black. Forewing: antemedial line almost vanished; postmedial line black, gently curved; submarginal line vague, sometimes represented by two or three black markings between veins; discocellular spot small, wholly black, well-defined; proximad of postmedial line paler than the rest. Hindwing: submarginal line zigzag, more prominent than in forewing; anal angle grey. Under-side: divided into proximal whitish and distal black areas by postmedial line; black discocellular spots well defined. Female. Wings similar to male in colour and maculation.

Male genitalia (Fig. 23). Distinguished from those of *altiprimata* as follows. Uncus shorter; ventral margin of costa with 15-20 longer setae only at the middle, less setose as a whole; spine-like setae on the ventral margin of valva not so stout, especially most apical one much finer; aedeagus curved, slightly sclerotized ventrally.

Female genitalia (Fig. 27). Sterigma sclerotized in a wrinkled and reticulate pattern posteriorly; ductus bursae narrowly sclerotized laterally; corpus bursae with a folded signum.

Holotype. ♂, S. Sulawesi, Palolo 700 m, ii. 1986 (S. Nagai), NSMT. Paratypes. S. Sulawesi, nr north border, Puncak Dingin 1,700 m, 1 ♂, ix-x. 1985, 1 ♂, x-xi. 1985 (S. Nagai); Palolo 700 m, 1 ♀, viii. 1985 (S. Nagai); Peleng Is., 1 ♂, ii. 1986 (S. Nagai), NSMT & RS.

***Ectropidia saitoi* sp. nov.** (Fig. 11)

Length of forewing. ♂ 15 mm. Similar to *subprimata*, but different from it as follows. Male antennal sensilla longer, terminal ciliated-setose part shorter, one-fifth of the whole length. Antemedial and postmedial lines more clearly defined. Medial area on forewing between both lines paler than the rest. Discocellular spot smaller, lacking on hindwing. Underside of hindwing without distal black area. Female unknown.

Male genitalia. (Fig. 24). Ventral margin of costa evenly covered with fine setae as in *altiprimata*. Spine-like setae on saccular process shorter and thinner than in *altiprimata* and setae on the ventral margin of valva very fine, not spine-like. Aedeagus almost straight, not sclerotized ventrally.

Holotype. ♂, S. Sulawesi, Bonthain, Parang Bintlo, Mt Lompobatang, 5. v. 1993 (S. & A. Saito), NSMT. Paratype. Same data as holotype, 1 ♂, RS.

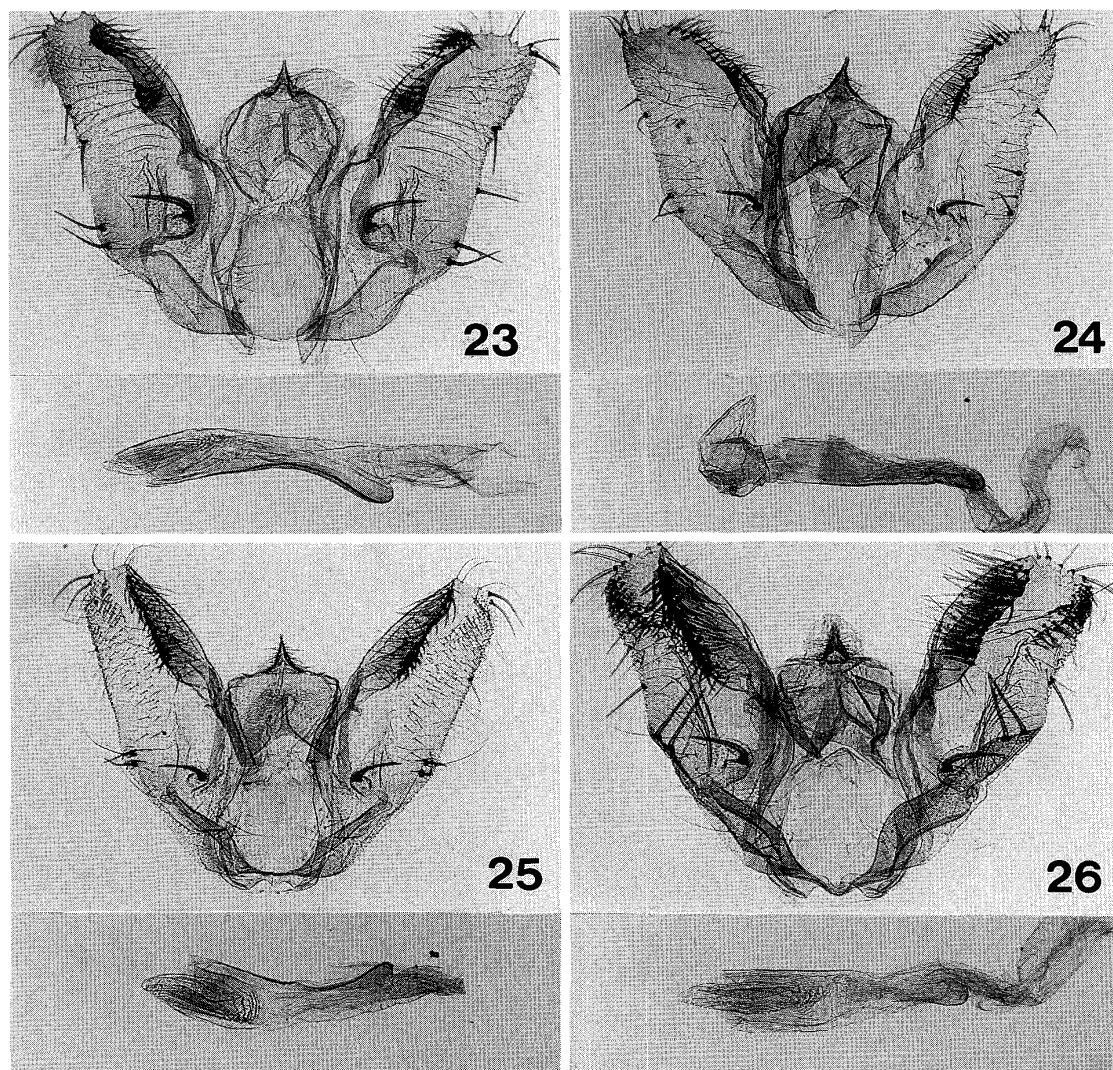
***Ectropidia hollowayi* sp. nov.** (Fig. 12)

Length of forewing. ♂ 14 mm. Male antenna as in *subprimata*. Both wings greyish white with black markings. Forewing: antemedial and postmedial lines black, gently curved, spotted at termen; submarginal line white, zigzag, with black shade basad; discocellular spot wholly black, well-defined; blackish brown broken band between postmedial and submarginal lines. Hindwing: discocellular spot prominent as on forewing; anal angle grey. Underside: paler than upperside; lines and discocellular spots similar to those of upperside; distad of postmedial line on forewing darker than the rest. Female unknown.

Male genitalia (Fig. 25). Almost identical with those of *saitoi* in characters of setae on valva except the lack of the most apical seate on the ventral margin of valva. Aedeagus curved, sclerotized ventrally as in *subprimata*.

Holotype. ♂, S. Sulawesi, Sampuraga 1,350 m, 1 ♂, 28. iv. 1994 (S. & A. Saito), NSMT.





Figs 23-26. Male genitalia of *Ectropidia* spp. 23. *E. subprimata* sp. nov. RS-4226. 24. *E. saitoi* sp. nov. RS-4308. 25. *E. hollowayi* sp. nov. RS-4227. 26. *E. paraprimata* sp. nov. RS-4225.

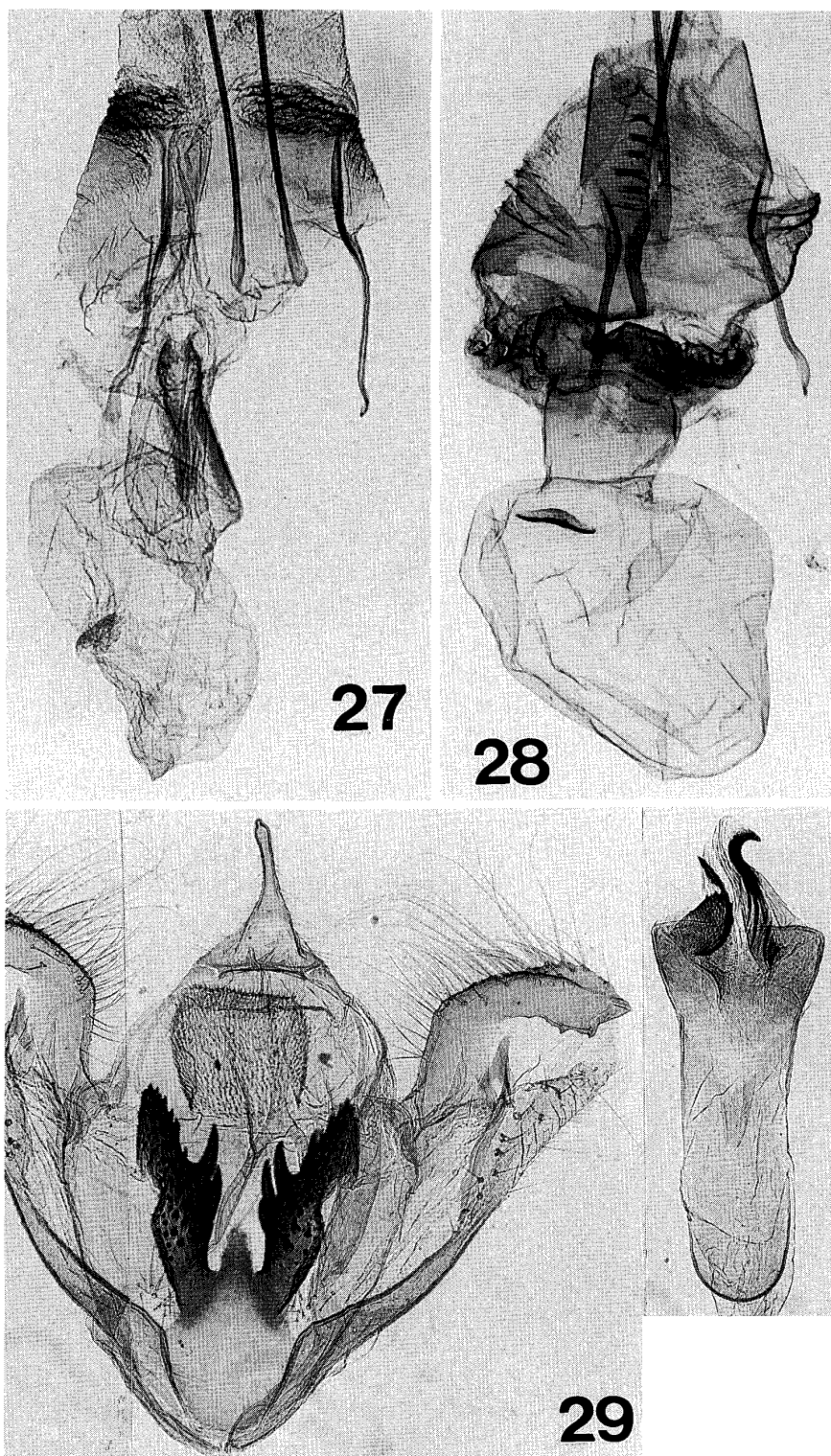
Paratype. S. Sulawesi, nr north border, Puncak Dingin 1,700 m, 1 ♂, ix-x. 1985 (S. Nagai), RS.

***Ectropidia paraprimata* sp. nov.** (Fig. 13)

Length of forewing. ♂ 14-15 mm. Male antenna as in *subprimata*. Forewing: reddish brown; antemedial line black, slightly curved; postmedial line black, strongly outcurved beyond discocellular spot and gently curved elsewhere; medial area between both lines whitish; submarginal line white, inconspicuous. Hindwing: antemedial line wanting; basad of postmedial line whitish; submarginal line zigzag, more conspicuous than on forewing. Underside: distad of postmedial line black in contrast with proximal whitish area; discocellular spots well-defined on both wings. Female unknown.

Male genitalia (Fig. 26). Ventral margin of costa covered with longer setae than in the other congeners. Spine-like setae on valva not so stout as in *altiprimata*, but as well as in *subprimata*. Aedeagus almost straight, not sclerotized ventrally.





Figs 27-28. Female genitalia. 27. *Ectropidia subprimata* sp. nov. RS-4315. 28. *Diplublephara cornujuxta* sp. nov. RS-4316.

Fig. 29. Male genitalia of *Diplublephara cornujuxta* sp. nov. RS-4239.

Holotype. ♂, N. Sulawesi, nr Tondano, Mt Makaweiben 1,000 m, v. 1988 (N. Nishikawa), NSMT. Paratype. Type locality, 1 ♂, xii. 1988 (N. Nishikawa), RS.

***Diplublephara* gen. nov.**

Type species: *Diplublephara cornujuxta* sp. nov.

Similar to the genus *Diplurodes* Warren, 1896, in appearance, male antenna, gnathos of male genitalia and signum of female genitalia, but easily distinguished from it as follows. Male abdomen with a pair of weak coremata only between segments 3 and 4, while in *Diplurodes* strong pairs between 4 and 5, and 7 and 8. Male genitalia: tongue-like process on tegumen lacking; costa of valva more developed, somewhat modified; sacculus lacking; juxta heavily sclerotized; aedeagus with some cornuti on vesica. Female genitalia: sterigma more heavily sclerotized; ostium surrounded by many wrinkles; ductus bursae without ribbing.

***Diplublephara cornujuxta* sp. nov. (Fig. 14)**

Length of forewing. ♂ ♀ 14–15 mm. Male. Forewing: antemedial line black, broad, gently outcurved, with basal fuscous band; postmedial line black, narrow, undulated; medial band fuscous, parallel with antemedial line; discocellular spot black. Hindwing: fuscous band developed, continued from basal band of forewing; postmedial line and discocellular spot as on forewing. Underside: distad of postmedial line and medial band black, sometimes on forewing proximad of medial band thoroughly black, the rest greyish white; discocellular spots clearly defined on both wings. Female. Similar to male in pattern, but less sharply defined.

Male genitalia (Fig. 29). Uncus slender. Gnathos with a distal broad, rectangular portion densely covered with short weak spines. Valva broad with heavily sclerotized costa and elongate triangular process at the middle; ventral margin of costa serrate distally. Juxta well-developed, bearing a pair of asymmetrical antler-like projections. Aedeagus short, broadened apicad, with a short spine-like, a roundish spinose and an elongate striated cornuti.

Female genitalia (Fig. 28). Sterigma with many ridges medially and laterally. Ductus bursae evenly sclerotized. Corpus bursae globular with a large folded signum.

Holotype. ♂, N. Sulawesi, nr Tondano, Mt Makaweiben 1,000 m, xii. 1988 (N. Nishikawa), NSMT. Paratypes. Same data as holotype, 1 ♂ 1 ♀; type locality, 1 ♀, v. 1988, 1 ♀, vii. 1988 (N. Nishikawa), NSMT & RS.

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**References**

- Holloway, J. D., 1991. Patterns of moth speciation in the Indo-Australian archipelago. *The Unity of Evolutionary Biology* (ed. by E.C. Dudley). Proceedings of IVth International Congress of Systematic and Evolutionary Biology. Dioscorides Press, Portland, Oregon.
- , 1993. *The Moths of Borneo*, part 11. Family Geometridae, Subfamily Ennominae. Kuala

Lumpur.

Prout, L. B., 1928. New and little-known Geometridae from North Celebes. *Bull. Hill Mus.* **2**: 247-253.

———, 1929. On the geometrid genus *Catoria* Moore. *Novit. zool.* **35**: 132-141.

Warren, W., 1895. New species and genera of Geometridae in the Tring Museum. *Novit. zool.* **2**: 82-159.

## 摘 要

スラウェシ産エダシャク亜科の2新属と8新種の記載 (佐藤力夫)

インドネシアのスラウェシ島から得られた標本に基づいて、シャクガ科エダシャク亜科の2新属と8新種を記載した。いずれも Boarmiini に所属するもので、現時点で他の地域からは発見されていない。新属: *Cryptomedasina*, *Diplublephara*. 新種: *Amblychia atropunctata*, *Catoria sulawesensis*, *Cryptomedasina nagaii*, *Ectropidia subprimata*, *E. saitoi*, *E. hollowayi*, *E. paraprimita*, *Diplublephara cornujuxta*.

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